DEQ Wind Energy Regulatory Advisory Panel (Wind RAP)
September 17, 2009 Meeting
Final Meeting Notes

Location: **DEQ Central Office, 2nd Floor Conference Room**
629 E. Main Street, Richmond, VA 23219

Start: 9:30 a.m.
End: 4:05 p.m.

RAP Lead/Facilitator: Carol Wampler, DEQ
Recorder: Debra Miller, DEQ

RAP Members Present:
Julie Langan, DHR
Bob Bisha, Dominion
Don Giecek, Invenergy (alternate)
Ray Fernald, DGIF
James Golden, DEQ
Nikki Rovner, Deputy SNR
Judy Dunscomb, TNC
Larry Land, Virginia Assoc. of Counties
Ronald Jenkins, DOF
Debi Osborne, Audubon (alternate)
Larry Jackson, Appalachian Power
Larry Nichols, VDACS (alternate)
John Davy DCR (alternate)
Tony Watkinson, VMRC
Ken Jurman, DMME
Dan Holmes, Piedmont Env. Council

RAP Members Absent:
Theo Wolff, Independent Developer
John Daniel, Troutman Sanders (alternate present)
Mary Elfner, Audubon (alternate present)
Stephen Versen, VDACS (alternate present)
Jayme Hill, Sierra Club-VA Chapter

Public Attendees:
Maria Papadakis, JMU (alternate)
Roger Kirchen, DHR (alternate)
Ronald Jefferson, Appalachian Power (alternate)
Melanie Davenport, DEQ
Elizabeth Murphy- VMRC (alternate)
David Phemister, TNC (alternate)
Jim Madden, BP Wind Energy
Richard Reynolds, DGIF (alternate)
Robert Hare- Dominion
Hank Seltzer, BP Wind Energy
Dave Groberg, Invenergy (alternate)
Emil Avram, Dominion (alternate)
John Anderson, BP

Agenda Item: Introductions

Discussion Leader: Carol Wampler
Discussion: The RAP members and other attendees were welcomed. After the introductions, the goals were revisited along with the need for subcommittees to provide recommendations. The full RAP will break into 3 subcommittees to conduct work related to their given topics. The subcommittees are to break and return to the full committee by 3 p.m.

The Wind RAP committee adjourned at 9:40am and subcommittee meetings began.
See Attachment A for the Living Resources Subcommittee Meeting Notes, Attachment B for the Landscape Subcommittee Meeting Notes, and Attachment C for the General Subcommittee Meeting Notes.
The Wind RAP meeting reconvened at 3:05 p.m.

Agenda Item: Public Forum

Discussion Leader: Carol Wampler, DEQ
Discussion: No one had signed up to speak, so no public forum was held.

Agenda Item: Brief Reports by subcommittees to Plenary Group

Discussion Leaders: Subcommittee Chairs
Discussion: Each of the subcommittees reported on the work done in their meetings. See subcommittee meeting notes for details of the discussions.

General Subcommittee: The subcommittee is progressing and there will soon be draft language for PBR application process, site plans, decommissioning, financial assurance, public participation, applicability/definitions, and permit modification requirements. Once developed, this will be sent to the other subcommittee chairs. There has been some difficulty with operation and design requirements so industry representatives will be asked to provide further information. The subcommittee will hopefully be finished prior to the end of the day on Oct. 13th. There will be issues deferred to plenary group.

Landscape Subcommittee: The subcommittee has identified 16 issues and will have whitepapers and suggested language for the next meeting. Much of what is being addressed has existing language to work from (visual, cultural, historic, etc) so it is hoped that will provide a good starting point.

Living Resources Subcommittee: The subcommittee is still discussing bats and mitigation issues, and has reached some agreement on how to find significant impact and monitoring/mitigation plan. The group is working on detailing the requirements and looking into capping permittee expenditure and wildlife impact. At the next meeting, they will have draft language on pre-construction and significant impacts on bats.

Agenda Item: Announcements

Discussion Leader: Carol Wampler, DEQ
Discussion: The Living Resources Subcommittee will have an additional meeting on October 6, 2009, at the DEQ's Central Office. This meeting has been noticed and the attendees were requested to let their constituency base know. When providing recommendations, the subcommittees are asked to provide substantiating reasons and justification for each recommendation. If appropriate, provide statutory authority. The next Wind RAP meeting will be held at the DEQ Central Office on October 13, 2009. This date will also be used for subcommittee work.

Agenda Item: Offshore Issues

Discussion Leader: Tony Watkinson, VMRC
Discussion: VMRC is continuing their efforts to identify wind resource areas that are underwater. They have set-up meetings with DEQ coastal policy group for next Monday. And have approximately 20 names of persons interested in serving. Thru working with this group, VMRC will develop a map that provides state water areas that are good for wind energy (or will not be). This workgroup will meet a couple of times at least, and any Wind RAP members that are interested should let Tony know. Once VMRC has completed its work, then the PBR regulation for off-shore will be developed.

DEQ Wind Energy Regulatory Advisory Panel (Wind RAP)
Attachment A – Living Resources Subcommittee Draft Meeting Notes
September 17, 2009

Location: **DEQ Piedmont Regional Office, Training Room**
4949-A Cox Road, Glen Allen, VA 23060

Start: 9:45 a.m.
End: 3:00 p.m.

Subcommittee Chair: Judy Dunscomb, TNC
Recorder: Mary E. Major- DEQ

Subcommittee Members Present:
Tom Smith, DCR
Bob Bisha, Dominion
Ray Fernald, VDGIF

Subcommittee Members Absent: none

Public Attendees:
Rick Reynolds, VDGIF (alternate)
Robert Hare, Dominion
Larry Nichols, DVACS (alternate)
Jim Madden, BP Wind
Emil Avran, Dominion (alternate)
David Groberg, Invenergy (alternate)
John Anderson, BP

Agenda Item: Welcome and introductions

Discussion Leader: Judy Dunscomb
Discussion: Ms. Dunscomb began the meeting by reviewing the agenda, the meeting objectives, and ground rules for the meeting.

Agenda Item: Discussion of pre-construction monitoring

Discussion Leader: Judy Dunscomb
Discussion: Ms. Dunscomb reviewed the group's commitment to achieve consensus on language for preconstruction monitoring that DEQ is required to have; posed the following questions:

- What are the components of mitigation plans?
- What post construction monitoring is needed: how many bats are killed under normal operations, how many killed under mitigation, how effective is the mitigation?
- Need an assumption of what is acceptable mortality.

A review of the previous flow chart for developing mitigation plans was discussed; reiterated the need to assure that all natural resources are covered. The group acknowledged that a precedent would be established by insisting that all resources be covered in any mitigation plan, not just endangered species. The focus is to create options for renewable resources *and* protect wildlife; therefore, there was a group consensus that mitigation plans need a cap to limit economic exposure while acknowledging that resources must be spent to determine appropriate monitoring and mitigation. Primary question is the cost.

Agenda Item: Discussion of Curtailment Estimate

Discussion Leader: Jim Madden
Discussion: Mr. Madden provided a chart of the cost of curtailment at Forested Mountain Ridge, Pa. from July through October 31 from 7 p.m. to 7 a.m. Significant discussion surrounding the "what ifs" pertaining the curtailment activity; chart represented the worst case scenario. No consensus.

Agenda Item: Discussion of mitigation plans

Discussion Leader: Judy Dunscomb

Discussion: Ms. Dunscomb began a list of mitigation options:

- Best management practices
- Need to assume a performance standard that the plan must meet
- What else is an option besides curtailment?
- What are the economic cap options; percent of revenue; cost per unit

Ms. Dunscomb then led a discussion on the steps for the permit from DEQ

1. Applicant must be willing to do a mitigation plan; if no, then the process stops.
2. Applicant submits mitigation plan complete with expenses for economic cap and identified performance standard (yet to be determined)
3. DEQ evaluates plan
4. Applicant implements plan
5. Applicant conducts monitoring
6. Monitoring results evaluated; Could permit require periodic evaluation with other agencies?

Key concern: What if performance standard is not met and the economic cap has been reached?
Consensus: Applicant does not loose permit if performance standard not met.
What is the agency procedure if plan is violated?

Agenda Item: Discussion of performance standard

Discussion Leader: Judy Dunscomb

Discussion: The discussion began with a review of the testimony provided VDGIF for one project reviewed by the SCC which recommended a value of 9.1 bats per unit as the best value to protect the population after significant consultation with bat experts throughout the eastern region of the United States. Industry representatives suggested a standard base upon mortality numbers for actual systems in place suggesting 40 bats per turbine. Significant discussion about the problem of setting a standard that could not be reached vs. the need to protect the habitat.

Subcommittee took lunch break from 11:50 p.m. to 12:55 p.m.

The group continued the discussion on the performance standard. Other option is a percentage of kill from monitored baseline. This approach is more acceptable to industry. Identified concerns of setting a specific number as establishing a precedent across the country; no other states have done so, mortality number for eastern region may be significantly different than in other regions, lack of data a significant problem. Industry would prefer a percent reduction based on monitoring gathered at site. Example: monitor 50 birds, mitigation results in 40, then you spend cap to continue to operate. Evidence suggests that one can achieve 75 to 80 percent deduction with mitigation and the 9.1 bats/unit should be a goal. No consensus.

Agenda Item: Discussion of Economic Cap

Discussion Leader: Judy Dunscomb

Discussion: Options for cap include percent of revenue, cost per megawatt and a set cost per unit or turbine. Industry doesn't like a percent of revenue as those numbers are very public, revenues change from year to year, very difficult to plan; would prefer more certainty in the process. Industry prefers cost per turbine. Not all costs are linear; need to build roads/transmission lines whether planning 20 turbines or 200; smaller farms much less efficient. Costs for monitoring and mitigation could be much higher in the early years, decrease with time.

Subcommittee took break from 2:10 p.m. to 2:25 p.m.

Industry provided very rough estimate for cost cap of $5,000 per turbine for both monitoring and mitigation. Ms. Dunscomb pointed to the fact that other experts (Mr. David Young) have estimated that initial monitoring can run from $200,000 to $300,000 thousand dollars depending upon the size of project. SCC project hearing examiner allotted $150,000 for monitoring for a 19 unit project. Industry should consider a higher figure for the first two years then drop to $5,000 per unit in subsequent years.

Agenda Item: Next meeting

Discussion Leader: Judy Dunscomb

Discussion: Additional meetings of the subcommittee are needed. Need additional information on monitoring plans, and, more information about the total cost of monitoring and the amount of accuracy for the dollar amount spent. Need additional discussion for a proposal for the performance standard. Ms. Dunscomb indicated that she would attempt to provide a flow chart for the permit process.
The next meeting is on October 6, 2009 in DEQ's Central Office (2nd floor).

Action items:

Ms. Dunscomb will attempt to provide a flow chart for the permit process.
Group needs additional information on monitoring plans:

- More information about the total cost of monitoring
- The amount of accuracy for the dollar amount spent
- Need additional discussion for a proposal for the performance standard

DEQ Wind Energy Regulatory Advisory Panel (Wind RAP)
Attachment B – Landscape Subcommittee Draft Meeting Notes
September 17, 2009

Location: DEQ Piedmont Regional Office, Pink Conference Room
4949-A Cox Road, Glen Allen, VA 23060

Start: 9:45 a.m.
End: 3:00 p.m.

Subcommittee Chair: Dr. Maria Papadakis, JMU (Co-chair); Dr. Jonathan Miles, JMU (Co-chair)
Recorder: Gary Graham, DEQ

Subcommittee Members Present:
Ronald Jenkins, DOF
Julie Langan, VDHR
Larry Land, VACO
Tony Watkinson, VMRC
Dan Holmes, PEC
Larry Jackson, APCO

Subcommittee Members Absent: Stephen Versen, VDACS

Guests/Speakers: Andrew McRoberts, Sands Anderson Marks & Miller

Public Attendees:
John Davy, DCR (alternate)
Elizabeth Murphy, VMRC (alternate)
Roger Kirchen, DHR (alternate)

Agenda Item: Agenda and Checklist of Issues (attachment 1)
Discussion Leader: Dr. Maria Papadakis, JMU
Discussion: Review of agenda.

Agenda Item: Communications Interference and Model "White Paper" Template
Discussion Leader: Dr. Maria Papadakis, JMU
Discussion: (See "Potential Adverse Impacts: Communications Interference" handout, attachment 2).

1. Decision: Model white paper should have: Background; Current Regulatory and Administrative Authority; Gaps and Problems with Current Regulatory Frameworks; Options for Permit by Rule (PBR); and Recommendations, which could contain proposed regulatory language or examples.
2. Propose that future white papers follow a template similar to the Communications Interference white paper. Will share with other subcommittees.

Agenda Item: Forest Fragmentation Issues
Discussion Leader: Ron Jenkins, DOF
Discussion: (See forest fragmentation handout, attachment 3.)

1. Different definitions of forest fragmentation, depending on who you talk to.
2. Net VA loss of forest land is approximately 27,000 acres/yr, up from 20,000 acres/yr - similar for other southern states.
3. Threat to biodiversity because small fragments of forest remnants are unable to support certain species.
4. Mitigation:
    a. Offsets are a possibility for reintegrating forest land: 1 acre of integrated land for 1 acre of fragmented land.
    b. Establish a reforestation fund to pay costs of integrating forest land.

   c. Establish conservancies on privately-held forested or reintegrated land.
5. Decisions:
   a. Incorporate language similar to recommendations from handout (attachment 3) in the PBR;
   b. Include "bad faith" language to prevent owners from bypassing PBR review;
   c. Add language for losses due to transmission lines;
   d. Revise the handout's invasive species language; and
   e. Provide authority for "no cut" zones in a new #5 recommendation (to attachment 3).

Agenda Item: Cultural Views
Discussion Leader: Roger Kirchen, DHR
Discussion: (See DHR "Assessing Visual Effects on Historic Properties" handout, attachment 4).

1. Previous agreements for cell towers and transmission lines may provide examples for mitigating visual impacts and establishing landscape conservancies.
2. DHR guidance for transmission lines may also provide useful examples for language for reviewing, evaluating and mitigating visual impacts. (See VDHR "Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia," attachment 5). DHR has a technical service provider list for the recommended surveys but does not certify or approve the providers.
3. DHR has an advisory role under conditional approval authority of the SCC. The applicant does not have to consult with DHR. But if SCC makes its approval conditional based upon DHR mitigations, then DHR has authority to ensure compliance through that SCC approval.
4. Decision: DHR will do a white paper in the format of the "template white paper" which will:
   - Front-load the application process.
   - Specify that DEQ has authority for conditional approval of a permit based upon mitigation recommendations.
   - Specify what needs to be in the application using DHR guidelines.
   - Specify review times for agencies with review responsibilities.
   - Provide for a "fast-track" process that requires early collaborative meetings (including meetings with local authorities).
5. Question for the Wind RAP Plenary Committee: What opportunities for review do we need to provide for states/counties and federal authorities for areas that adjoin the site of wind projects? Who should be invited to submit comments and how near to the project should they be?

Agenda Item: Scenic and Recreational Views
Discussion Leader: John Davy, DCR
Discussion:

1. DCR "Draft Proposal for Visual and Recreational impact Assessment for Wind Turbines, September 15, 2009" handout (attachment 6).
2. Decision: DCR will do a white paper in the format of the "template white paper" which will:
   - Use the considerations discussed in the DCR handout; and
   - Specify what DCR would like to see in the PBR.

Agenda Item: Erosion and Sedimentation (E & S)
Discussion Leader: Dr. Maria Papadakis, JMU
Discussion: (See "Potential Adverse Impacts: Landscapes of Ecological Importance - Erosion and Sedimentation" handout, attachment 7).

1. In order to strengthen the E & S program, the handout recommends:

   a. Early notification of the project to DCR by the applicant;
   b. A surety bond be secured of the total amount necessary to implement the E & D control plan; and
   c. Use of third-party inspectors at the project to monitor compliance with the E & S control plan.
2. Possible language is provided in the handout for the "third-party inspector" option. Suggestions for language to implement the early notification and the surety bond recommendations are still needed.

Agenda Item: Future Meetings and Process
Discussion Leader: Dr. Maria Papadakis, JMU
Discussion:

1. Dr. Jonathan Miles, JMU, will run the remaining meetings of the subcommittee.
2. There will be no additional meeting until the final meeting on October 13.

Agenda Item: Local Government Land Use Authority
Presentation by: Andrew McRoberts, Attorney from Sands Anderson Marks & Miller
Discussion:

1. Original authority for police powers derives from health, safety and welfare concerns.
2. Euclidean zoning was the basis for modern zoning ordinances and zoning actions.
3. Virginia assumed the authority of government from the King of England.
4. Code of Virginia §15.2, Chapter 22 determines what local authorities can do to regulate land use and how they can do it. Virginia follows the Dillon Rule: localities have authority for land use only as assigned by the state.
5. As long as the local authority acts as allowed by Code of Virginia, acts legislatively (as a body) and acts reasonably (not arbitrary or capricious), then courts give broad deference to land use decisions by local authorities.
6. When state regulation and local land use authority overlap, both requirements must be satisfied and so the more restrictive requirement of the two is usually the one that applies.

Agenda Item: Transmission Lines
Discussion Leader: Larry Jackson, APCO
Discussion: (See AEP Siting Process and SCC Approval Process Flow Chart, attachment 8)
Persons, organizations, and companies which are not utilities that put in their own transmission lines from wind towers are not regulated by the SCC because they are not a regulated utility.

Agenda Item: Action Items and Assignments
Discussion Leader: Dr. Maria Papadakis, JMU
Discussion:

1. Prepare white papers in the format of the "template white paper.
2. Communicate by phone and email to develop white papers.
3. All assignments are due to the chair (Dr. Papadakis, JMU) by close of business September 25, 2009.

DEQ Wind RAP
Sept. 17, 2009
DEQ Piedmont Regional Office

Landscape Subcommittee Agenda

Time	Minutes	Topic
9:30	5	• overview of today's work • distribute any handouts and copies of "homework" • take orders for lunch delivery
9:35	15	• Communications Interference • Model "White Paper" template
9:50	60	Forest Fragmentation
10:50	10	Break
11:00	90	Cultural and Scenic Views
12:30	30	• Break for lunch • Selecting date/time for an additional meeting
1:00	30	• Erosion and Sedimentation (finalize) • Other?
1:30	60	Local Land Use • Guest speaker: Andrew McRoberts, Esq. • Agricultural land use issues (Steve V.)
2:30	30	• Transmission Lines
3:00	10	• Wrap up, homework, next steps

As of September 4, 2009

Checklist of Issues and Potential Adverse Effects To Be Considered by the Landscape Committee

Issue/Potential Adverse Impact	Assigned To
❑ **Land Use Zoning and Ordinances**	
A. What is within local planning authority, and what needs to be addressed in the PBR.	Larry Land
B. Competing (zoned) land uses, and loss of agricultural lands	Steve Versen
❑ **Landscapes of Cultural Importance**	Julie Langan and Roger Kirchen
❑ **Landscapes of Scenic Importance**	DCR (Tom Smith/John Davy)
❑ **Water Resources**	
A. Wetlands	
B. Surface waters	
C. Ground water	
D. Stormwater	
❑ **Communications Interference**	Maria Papadakis
❑ **Solid And Hazardous Waste**	Maria Papadakis
❑ **Air Quality Impacts From Construction**	Jon Miles
❑ **Ground Transportation And Traffic During Construction**	Jon Miles
❑ **Landscapes Of Ecological Importance**	
A. Forest fragmentation	Ron Jenkins
B. Soil erosion	Maria Papadakis
C. Disturbances to specific ecosystems/ecologies (e.g., high elevation hemlock forests)	Dan Holmes
❑ **Impacts Associated with Power Line Interconnection**	Larry Jackson

Potential Adverse Impacts: Communications Interference

Background

The operation of wind turbines has the potential to interfere with broadcast and other communications signals. Although the airwaves and broadcast spectrum are not traditionally thought of as a "natural resource," their physical properties do make them an inherent part of our physical (natural) environment. According to AWEA's *Wind Energy Siting Handbook*:[1]

> Wind projects may impact communications signals in two ways. Wind turbines and their associated transmission lines can generate electromagnetic noise, which can interfere with telecommunications services, or, more commonly, wind turbines create physical obstructions that distort communications signals. The types of communications systems that may be affected include microwave systems, off-air TV broadcast signals, land mobile radio (LMR) operations, and mobile telephone services (p. 5-51).

Several straightforward engineering solutions are available to mitigate potential communications interference.

Current Regulatory and Administrative Authority

Federal regulation is involved in identifying the impacts of wind installations on federal microwave towers, and the FAA also reviews installations for their impact on radar. Otherwise, there is no regulation in Virginia governing communication signals. [Confirm.]The local land use authority could, in principle, address this issue in its zoning and ordinance regulations. Several model wind ordinances in other states include model language for protecting communications signals from interference from wind turbine operations.

Gaps and Problems with Current Regulatory Frameworks

The principle difficulty with the existing regulatory framework is that it is somewhat an "optional" issue for local land use jurisdictions. If local authorities do not address this potential problem through zoning law, then the public could be left unprotected and without recourse for remedy except for general civil damages.

Options for the Permit by Rule

1. Do nothing other than acknowledge existing federal regulations and the authority of local land use jurisdictions to regulate communications interference.
2. Include language that obligates the applicant to assess for and mitigate potential interference.

Recommendation: Obligate Applicants to Mitigate Potential Interference (Y/N?)

The Landscape Subcommittee recommends that the PBR include obligatory language on this issue. Model language from other state ordinances is provided below.

[1] American Wind Energy Association, *Wind Energy Siting Handbook* (2008). Available online at http://www.awea.org/sitinghandbook/download_center.html.

From New York State[2]

- The applicant shall minimize or mitigate any interference with electromagnetic communications, such as radio, telephone or television signals caused by any wind energy facility.

  or

- No individual tower facility shall be installed in any location along the major axis of an existing microwave communications link where its operation is likely to produce electromagnetic interference in the link's operation.

  and

- No individual tower facility shall be installed in any location where its proximity with fixed broadcast, retransmission or reception antenna for radio, television or wireless phone or other personal communications systems would produce electromagnetic interference with signal transmission or reception.

From Pennsylvania[3]

SIGNAL INTERFERENCE

The Applicant shall make reasonable efforts to avoid any disruption or loss of radio, telephone, television or similar signals, and shall mitigate any harm caused by the Wind Energy Facility.

[2]New York State Energy Research and Development Authority, *Wind Energy Model Ordinance Options* (2005). Available online at http://www.powernaturally.org/programs/wind/toolkit/2_windenergymodel.pdf.
[3]Office of the Governor, "Model Ordinance For Wind Energy Facilities In Pennsylvania" (April 2006). Available online at http://www.depweb.state.pa.us/energy/cwp/view.asp?a=1370&Q=485761.

Develop a clear statement of the adverse impacts of wind energy facilities on forest conversion and forest fragmentation, and what should be done to mitigate those impacts.

The Virginia Department of Forestry believes the loss of forest land in Virginia is significant to the forest economy and environment, and accelerated by conversion to other uses and due to fragmentation. Losses of forest land are known to occur because of the change of forest use to development. Fragmentation of forest reduces the amount of forest land and the uses of forests through the breakup of contiguous forests into separate forest parcels.

Construction for wind energy projects of less than 100 megawatts power generation will contribute to the additional losses of forest land through fragmentation and direct loss of the forests. The anticipated losses due to wind energy projects will be miniscule in comparison to the current estimated loss of 27,000 acres per year to development and other conversions. The additional losses by wind energy and other development require consideration and possible mitigation actions by Commonwealth in the future.

What should be done to mitigate the adverse impacts of wind energy facilities?

1. Provide funding for conservation of other existing forests, or for the establishment of new forests. This should include the losses due to transmission lines.

2. Require approved E&S permits to prevent sedimentation movement from the site and erosion as currently required by any other land disturbance / construction project in Virginia. DCR would be the principal regulatory enforcement agency. DOF could provide advice and on the ground assistance for best management practices.

3. Require that all vegetation used following construction consist of native species. Insist that all known invasive species found on the site be eradicated.

4. Require pre – construction site review of wind energy projects to determine the forest species, forest area loss; invasive species; and impact on local/regional forest economy. The Department of Forestry should review and be provided the authority to determine no-cut zones; forest loss compensation, best management practices, invasive species mitigation, and other general forest conditions for permit issuance.

VIRGINIA DEPARTMENT OF HISTORIC RESOURCES

ASSESSING VISUAL EFFECTS ON HISTORIC PROPERTIES*

INTRODUCTION

Communication towers, additions constructed on historic buildings, highways, and other types of construction introduced to a landscape may cause adverse effects to the landscape and surrounding properties in a variety of ways, including visually. Adverse visual effects can be caused by a change in aesthetic values or by obstruction of views. In regard to a historic property, adverse visual effects are those that diminish the property's integrity, which negatively affects its historic significance and hence its eligibility for listing in the National Register of Historic Places.

Within a variety of review processes, the Department of Historic Resources (DHR), which in Virginia is the State Historic Preservation Office, evaluates and assesses the effects a project may have on historic properties. Some effects, such as demolition of a historic property or disturbance of an archaeological site, can be easily evaluated and determined as being adverse. However, assessing the impact of visual effects is not so easily accomplished and may require more in depth evaluation and discussion.

The DHR developed these issues and guidelines to provide guidance for assessing visual effects on historic properties in Virginia. The guidelines also act as inner-office guidance for DHR to help evaluate effects and support determinations. DHR staff will use these guidelines when offering technical assistance, reviewing Section 106 projects, reviewing projects pursuant to applicable state environmental laws and regulations**,** and commenting on activities affecting easement properties, as well as other applicable situations. Regional and local review boards and officials may also adopt the guidelines for their use.

PURPOSE

The purpose of the policy, issue, and guidelines is to provide guidance for DHR staff, agencies, applicants, and others in assessing the visual effects on historic properties due to new construction or other alterations to the landscape. The policy and issues section explain the policy of DHR and the issues of assessing visual effects and will begin to substantiate evaluations to the extent possible. The guidance section will provide general approaches and principles to help assess and address visual effects on historic properties.

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* Portions of this document were adapted from "Assessing Visual Effects on Historic Properties" written by the Delaware SHPO.

POLICY

It is the policy of DHR to advise agencies, applicants, and others to avoid adverse visual effects on historic properties whenever feasible, or if avoidance is not possible, to minimize those effects through design alternatives such as lowering the facility to the minimum height programmatically necessary or disguising the facility through "stealth" methods. If, even after the implementation of recommended design alternatives the adverse visual effect persists, further mitigation efforts through recordation, landscape treatments or other appropriate responses may be necessary.

DEFINITIONS

Adverse Effect –occurs when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register of Historic Places in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative. One example of an indirect adverse effect is the introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features.

Adverse Visual Effect –occurs when there is a substantial diminishment of the qualities of a place or structure that contribute to the significance of the resource or helps one to understanding its importance. An adverse visual effect may be caused by the introduction of a new feature into the landscape that can be seen from an historic property and is incompatible with its historic character, or obstructs the primary views toward or from the resource thereby diminishing the understanding or appreciation of the property.

Historic Property – Any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places.

Landscape – The natural and man-made environment.

Viewshed – The area that is visible from a specified location or locations.

Visual effect – occurs when the proposed object is viewable from an historic property, within the boundary of an historic property or obstructs, impedes or otherwise diminishes the view toward an historic property. A visual effect may be beneficial or adverse and may affect the historic property in an aesthetic or obstructive manner. The determination that a visual effect exists does not automatically imply that the effect is adverse.

ISSUES OF VISUAL EFFECT AND HISTORIC PROPERTIES

Subjectivity

The introduction of a new feature to a landscape can create visual effects, which may be positive or negative. Due to the fact that visual effects cannot be quantitatively measured and may not harm the elements of a historic property in a physical manner, assessing visual effects on historic properties can be difficult and relies primarily on subjective analysis. However, it is possible to remove much of the bias from the process by gaining knowledge about the historic property visually affected. An historic property is affected when its historic integrity, that is, those characteristics that convey a resource's significance, has been diminished. Therefore, determining why a property is significant and understanding what characteristics make it so are essential to assessing visual effects.

Historic Significance and Integrity

Historic properties convey their significance through their integrity. The aspects of integrity are: location, design, setting, materials, workmanship, feeling, and association. During review of projects taking place on or near an historic property, consideration of the criteria in which the property was determined historically significant and evaluation of whether the introduction of the new feature will adversely affect the property's integrity are critical. Therefore, whether or not the new feature is located on the historic property, it is necessary to evaluate the changes and alterations the new feature will introduce, physically and visually, to the historic property. In addition, the changes the project may cause to the total landscape are important factors in assessing the historic property's relationship to its setting, which may include the property's surrounding features and open spaces. However, simply being visible from the historic property may not cause an adverse effect. For instance, if the setting of an historic property is not essential to understanding its significance, then the introduction of a new feature in that setting may not diminish the integrity of the historic property. For additional information on applying the criteria of significance and assessing the aspects of integrity, please reference *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation*, which is available through the National Park Service.

Cumulative Visual Effect

A cumulative visual effect is a visual impact on an historic property that increases by successive additions to the landscape. For example, the construction of a cellular communications tower within the viewshed of an historic farmhouse may not in and of itself constitute an adverse effect. However, if over time additional cell towers are constructed within the historic farmhouse's viewshed, the cumulative visual effect of the cell towers taken in total may constitute an adverse effect because the ability of the farmhouse to impart its rural character, i.e. setting, is diminished. As with visual effects, determining when the successive addition of new features to the landscape has a cumulative visual effect is a subjective judgment. As before, understanding the nature of the historic property and what makes it significant will greatly assist in evaluating cumulative visual effects.

GUIDANCE FOR ASSESSING VISUAL EFFECTS

Photo-Simulations

As stated earlier, determining what constitutes a visual effect is largely subjective. However, a general rule to follow is that if something can be seen from an historic property, obscures the historic property from being seen at primary locations or is visible within the boundary of the historic property, there is a visual effect to that historic property. Therefore, it is important to first identify the extent of the viewshed to and from the historic property. To do this, it is necessary to illustrate the anticipated extent to which a proposed facility, such as a cellular communications tower or water storage tank, will be visible from an historic property. Generically such illustrations are referred to as "photo-simulations".

Photo-simulations can be accomplished in a number of ways ranging from the use of specialized computer software to a rough estimation from a terrain analysis based on a U.S.G.S. topographical map. One popular method is to conduct a "red balloon test", which consists of raising a helium-filled red balloon (it is not required that the balloon be red, what is important is that it can be see from great distances) on a tether to the height of the proposed facility and photographing it from the historic property and other important vantage points. The red balloons come in a variety of sizes and may be purchased from scientific supply stores that stock weather balloons. To enhance the visibility of the red balloon in photographs, it is often useful to utilize a drawing program (e.g. Corel Draw, Photoshop, Illustrator) in order to graphically depict the proposed facility in the photograph. Elevation profile programs such as National Geographic's "Topo!" are helpful to determine the effect of topography on the visibility of the subject facility.

Regardless of the method used to determine the expected visibility of a particular structure from an historic property it is important to remember to make the calculations from the maximum height of the facility, not merely its site location. It is also essential that the photo-simulations clearly and accurately convey to the DHR reviewer or other cold reader the anticipated visual effect of the undertaking from the historic resource and significant vantage points on the property.

Assessing Visual Effects

Once photo-simulations are available to provide an accurate understanding of how much of a new facility is visible from a historic property and from where, one may then begin to assess the visual effect that the undertaking will have on the resource. In doing so, one should ask the following questions:

- Why is the historic property significant?
- What characteristics of the historic property convey that significance?
- How and to what degree are those characteristics diminished by the visibility of the project facility from the historic property?

- Does the diminishment of those characteristics lessen one's understanding or appreciation for the historic property?
- If one's understanding or appreciation for the historic property is lessened, how is it lessened and to what degree?

Why is the historic property significant?: This question is answered by understanding the historic context of the property and evaluating it within that context by applying the National Register Criteria for eligibility. Guidance on how to evaluate a property according to the National Register Criteria is found in *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation*. Briefly, in order for a property to be eligible for listing to the National Register of Historic Places, a property must be significant under at least one of the following criteria:

- Criterion A: An event, series of events or activities, or patterns of an area's development.
- Criterion B: Association with the life of an important person.
- Criterion C: A building form, architectural style, engineering technique, or artistic value, based on a stage of physical development, or the use of a material or method of construction that shaped the historic identity of an area.
- Criterion D: The potential to yield information important in prehistory or history.

What characteristics of the historic property convey that significance?: It is not enough that a property is significant under one or more of the above National Register Criteria, the property must also be able to convey that significance through its historic integrity. In order to retain its historic integrity, a property will possess several, if not all, of its characteristics of integrity. These characteristics of integrity consist of the property's location, design, setting, materials, workmanship, feeling, and association. The relative importance of each of these characteristics to a particular property will vary depending on the why, where, and when the property is significant. For a more detailed explanation of historic integrity please refer to *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation*.

How and to what degree are those characteristics diminished by the visibility of the project facility from the historic property?: After one has determined what characteristics of a property are important in conveying its significance, one must then consider how and by how much those characteristics are impacted by the introduction of the new facility to the property's viewshed. For example, if one considers the physical location of an historic property essential to its significance, it is unlikely that this characteristic will be appreciably diminished by the mere visibility of the new structure from the historic resource. However, if the property's setting is deemed an important element of its integrity, clearly perceiving the new facility from the historic resource may be considered to diminish that characteristic. Even if this is the case, one must then evaluate to what degree the property's setting is diminished. In a situation where the historic resource is already surrounded by modern development, the construction of another structure in the property's viewshed will certainly have less of an impact than if the new facility was impacting a pristine rural setting. However, one must be sure to consider the concept of cumulative effect when assessing the degree of diminishment (for a discussion of cumulative effect see above).

Does the diminishment of those characteristics lessen one's understanding or appreciation for the historic property?: For an historic property to have interpretive value as an artifact of a specific place and time, it must be able to be understood and appreciated within its particular historic context. For example, it is often possible for a visitor to a battlefield to gain personal insight into the event by walking the ground where the fighting occurred. This exercise helps one to more readily understand troop movements, influence of terrain, and leadership decisions that contributed to the battle's outcome. Such an understanding becomes limited or impossible if modern intrusions obstruct important views of the battlefield that were available to the participants at the time of the event.

In some circumstances where strategic views within the boundary of an historic property are retained, it is still possible to diminish one's understanding and appreciation of the resource. This may occur if modern intrusions are present around the outside perimeter of the property boundary to such an extent that the historic feeling and setting are lessened, or spatial relationships to other features important to the history of the property are severed. For example, the rural character of a mid-nineteenth century farmstead and its sense of place may be impacted if urban development such as high-rise apartment buildings, highway overpasses or cellular communications towers surround the remaining agricultural acreage. Additionally, even though visual intrusions may lay outside of the historic land parcel and do not interfere with significant views from within the boundary comprising the surviving farming complex and associated fields, pastures, paddocks, etc.; the modern development may obscure important vistas as experienced from the property such as views to a river or stream, a ridgeline or former road trace that further help one to understand the history of the resource.

If one's understanding or appreciation for the historic property is lessened, how is it lessened and to what degree?: What this question is really asking is: Does the visual intrusion constitute an adverse visual effect? A visual intrusion into an historic property's viewshed that substantially hinders or prevents one from experiencing the property within its historic context is, by definition, an adverse visual effect. Admittedly, making this determination is sometimes difficult because such an analysis is often largely subjective and is influenced by many unrelated factors such as an individual's experience, knowledge of the resource and preservation practices, and inherent biases. However, these variables can be greatly minimized by focusing on the reason(s) why the property is significant and what characteristics of integrity are most important in conveying that significance. If any or all of the resource's important characteristics of integrity are substantially impacted by the introduction of the new facility into the viewshed resulting in a lessening of one's understanding or appreciation of the resource, then there is an adverse visual effect on the historic property.

GUIDANCE FOR MITIGATING ADVERSE VISUAL EFFECTS

Introduction

Once an adverse visual effect on an historic property is recognized, it is desirable to develop a strategy that reduces or eliminates the negative impact to the resource. In projects that are federally funded, licensed or permitted and are subject to review under Section 106 of the National Historic Preservation Act, exploring alternatives that minimize or remove the adverse visual effect is mandatory. Regardless of whether an adverse visual effect is being mitigated due to a federal statutory requirement, an exercise in local municipal or county community planning or as a private initiative, there are many common principles to developing an effective mitigation strategy.

Developing an Effective Mitigation Strategy

Obviously, the most efficient means to deal with an adverse visual effect on an historic property is to eliminate it completely from the resource's viewshed by either relocating the cause of the effect far enough away from the historic property so that it is no longer an issue, or to a less offending location within the viewshed. Unfortunately, this is not always possible and other measures to address the adverse effect must be considered. In such circumstances mitigation options are limited only by the participants' imaginations and may consist of redesigning the facility to lessen the visual impact upon the historic property, planting trees to create a visual buffer between the intrusion and the resource or, for situations where the visual adverse effect is so extreme that it cannot be dealt with directly, finding alternative methods that further historic preservation. Such alternative methods may include funding a historic structures report, conducting an archaeological survey or arranging an exhibit with the local historical society. Whatever strategy is decided upon to mitigate the adverse visual effect, it should follow some basic principles in order to be considered effective.

Principles of an Effective Mitigation Strategy

An effective mitigation strategy for an adverse visual effect should be consistent with the following principles.

1. <u>The Mitigation Should be Appropriate to the Nature of the Effect</u>: An effective mitigation strategy addresses directly the cause of the visual adverse effect and its consequences to the historic property. This ensures that the mitigation efforts properly focus on minimizing the effect on the specific characteristics of integrity that are diminished as a result of the new facility. Outcomes may include redesigning the proposed intrusion to lessen its appearance on the landscape, or involve tree plantings to provide a visual barrier between it and the historic property. However, one must be aware that some seemingly obvious solutions, such as vegetative screening, may actually result in unforeseen additional visual effects. Additionally, many proposed mitigation strategies may prove impractical in circumstances where the scale of the new structure, its proximity to the resource, or technical constraints do not allow for direct mitigation. In these cases more creative opportunities for mitigation may be sought, however, these creative options should still concentrate on the affected historic property.

2. The Mitigation Should be Appropriate to the Significance of the Resource: One should take into account the relative importance of the historic property being impacted when considering options for mitigation. The property's level of significance (local, state, national) and whether it is individually eligible for the National Register of Historic Places, or as a contributing element to a larger historic district, will help determine the appropriate scope of mitigation.
3. The Mitigation Should Provide the Largest Public Benefit Possible: As an historic property listed in or eligible for the National Register of Historic Places may be said to represent our nation's collective cultural heritage, adversely effecting it impacts an entire community, not just a single property owner. Therefore, whenever feasible mitigation should strive to provide the largest public benefit possible. Examples of mitigation that provides public benefit are funding a historic highway marker, producing a walking tour brochure for an historic district, or sponsoring a local history exhibit a county library.
4. The Mitigation Should Take into Account the Views of the Property Owner, Community, and Other Interested Members of the Public: When brainstorming about appropriate mitigation for an adverse visual effect it is advisable to solicit comments and ideas from those individuals and organizations with a demonstrated interest in the historic property and negative impacts to it. By doing this, one hopes to gain insight into the value that the local community places on the affect resource, and what measures it believes will properly atone for the diminishment of the historic property's significant qualities. Some appropriate individuals or groups to consult may include the property owner, the local historical society, the municipal or county governments, and Native American tribes with a documented cultural affiliation to the area. The efforts to include public participation depend on the nature and scope of the project, significance of the affect resource, and degree to which the project will impact the historic property. If the project is a federal undertaking under Section 106, public participation is mandatory.

CONCLUSION

New construction may cause visual effects to an historic property that could diminish the property's characteristics of integrity. In such circumstances, the visual effect is said to be adverse because it lessens those qualities that make the resource eligible for listing in the National Register of Historic Places. It is the policy of DHR to advise agencies, applicants, and others to avoid adverse visual effects on historic properties whenever feasible, or if avoidance is not possible, to minimize those effects through design alternatives. If, even after the implementation of recommended design alternatives the adverse visual effect persists, further mitigation efforts may be necessary.

For additional guidance or questions regarding DHR policy on assessing and mitigating adverse visual effects, please contact DHR, Office of Review and Compliance at (804) 367-2323.

Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia

This guidance has been developed by the Department of Historic Resources (DHR) to assist the State Corporation Commission (SCC) and their applicants in developing transmission line projects that minimize impacts to historic resources. The goals of this analysis are to (1) develop project alternatives that are sensitive to historic resources, (2) generate meaningful data on the potential effects of proposed alternatives on known historic resources, (3) determine the impact of selected alternatives on all resources eligible for listing in the Virginia Landmarks Register and National Register of Historic Places (National Register), and (4) develop recommendations on ways to minimize effects to historic resources.

This guidance is intended as technical assistance to the SCC and their applicants. Completion of these studies may not fully satisfy the requirements set forth by any Federal agency with responsibilities under Section 106 of the National Historic Preservation Act (NHPA) or other Federal law or regulation. It is critical that the project proponent consult directly with all relevant Federal agencies as necessary in the completion of these studies.

I. Pre-Application Analysis

Analysis conducted by the project proponent during the preparation of an application to the SCC is intended to guide the design of the project and aid in the selection of a preferred alternative. By determining the potential impact of the project on recorded historic resources during the application process, the applicant and the SCC may make informed decisions regarding the relative impacts of project alternatives. This pre-application analysis is not intended as a substitute for comprehensive historic resources survey. Full archaeological and architectural surveys are recommended for all approved alternatives. See Section II of this document for more information on recommended comprehensive surveys.

A. Establish a study area for each alternative under consideration. Study areas are tiered to ensure consideration of the Commonwealth's most important resources. The table below shows the four tiers of the study area and the resources that should be considered in each tier.

Radial Buffer (in miles)	Considered Resources
1.5	*National Historic Landmarks*
1.0	Above resources, and: *National Register Properties* (listed) *Battlefields* *Historic Landscapes* (e.g. Rural HD)
0.5	Above resources, and: *National Register-eligible* (as determined by DHR)
0.0 (within ROW)	Above resources, and: *Archaeological Sites*

If the proposed new right-of-way (ROW) exceeds 500 feet in width, the radial buffer should be drawn from the edges of the ROW and not the center line. The study area may be refined through the use of GIS-based spatial analysis of topography and vegetation to exclude areas that would not have a line-of-sight to proposed facilities. Any areas excluded from analysis need to be fully documented and justified in the resulting report. Since vegetative cover is dynamic, meta-data to include date of origin should be provided as part of a discussion of methodology. Areas containing National Historic Landmarks cannot be excluded from analysis.

B. Gather information on known resources. Once appropriate study areas have been established, data on recorded historic resources should be obtained from DHR. Data must be current to within six months of analysis. Affected cities, counties, and localities should be consulted during this stage of the process to ensure consideration of those resources significant at a local level. DHR also recommends gathering information and comments from other agencies and organizations, such as the National Park Service and local historical societies.

C. Assess impacts on known resources. A qualified cultural resources consultant in the appropriate discipline should perform an assessment of impact for each historic resource present within the appropriate tier of the study area provided it is not otherwise excluded from analysis. The analysis and report should include the following:

1. Executive Summary of impacts assessment. Narrative should be accompanied by a data table showing the resource number, name, and potential impact.

2. Statement of scope, methodology, fieldwork (dates, staff).

3. Project maps showing all center lines, radial buffers, and recorded resources subject to analysis. Any spatial analysis conducted that results in excluded areas should be shown on separate project maps. All submitted mapping should be at a legible scale.

4. Discussion of any recorded archaeological sites located within the proposed right of way, to include statements on previous investigations, National Register-eligibility determinations, and potential impacts.

5. Ground photography for each property including, at a minimum, photographs of the main elevation of the primary resource and from the resource towards the project. Be sure to consider the views from the entire property, including secondary resources and historic landscape features, not just the primary resource. The National Register nomination and/or other archival material should be consulted to determine if specific viewsheds are noted as significant. All efforts should be made to accurately represent the viewshed. Panoramic photos are most useful in this analysis.

6. Aerial photograph for each property showing the boundaries of the property, location of primary and secondary resources, a key to the ground photography, and depiction of the proposed line and distance from the resource. The date of the aerial photograph should be included.

7. Photosimulation of the proposed transmission line and towers from significant points on the property. If there are existing towers in or adjacent to the proposed ROW and the proposed towers are the same or lesser height than the existing, no photosimulation is necessary. If new towers will be substantially taller than the existing towers (>10% or 20' increase, whichever is greater), photosimulation is warranted. The means of producing accurate photosimulations is left to the discretion of the consultant, but should be thoroughly discussed as part of the methodology. If a property is not excluded from analysis, but after field assessment, is determined not to have a view of the proposed project, the estimated location and height of the proposed towers should be represented on ground photography.

8. Elevation drawing of proposed and existing (if applicable) tower designs and ROW configuration corresponding to the viewshed of each property.

9. Narrative description of the resource, environmental conditions, and any potential effects from the proposed line. This analysis should consider whether the historic setting is a character defining feature of the resource. The qualified professional conducting the analysis of impact should develop a meaningful hierarchy to characterize the effects to each property.

II. Survey of Approved Alternatives

Once an alternative is approved by the SCC, DHR recommends that full archaeological and architectural surveys be performed to determine the effect of the project on all historic resources listed in or eligible for listing in the National Register. This process involves the recordation of all archaeological sites and structures greater than 50 years of age, the evaluation of those resources for listing in the National Register, determining the degree of impact of the project on eligible resources, and developing a plan to avoid, minimize, or mitigate any negative impacts. Comments received from the public or other stakeholder regarding impacts to specific historic resources should be addressed as part of this survey and assessment process.

A. Defining the survey area and scope of the survey. The survey area for any approved alternative should take into consideration the types of resources that may be affected and the nature of expected impacts. Of special concern are effects to the historic setting and viewshed of significant historic resources. A difference can be drawn between the potential impact of a new line built on raw land and a new line constructed within existing ROW. This guidance takes into consideration these differences. For approved projects, the survey area and scope are defined as following:

1. Archaeological survey should be performed on all areas that will be directly impacted by construction, including proposed ROW, tower and associated facility locations, staging areas, and access roads. If the ROW can be cleared without ground disturbance, such as stump grubbing, comprehensive archaeological survey of the entire ROW will not be necessary. A ROW clearing plan must be submitted for review prior to DHR approval of this methodology. Survey of tower locations would still need to be performed.

2. For all portions of the proposed line to be constructed within existing ROW, where no new areas of vegetation will be cleared outside of the existing maintained ROW and

there will be no substantial increase in tower height (<10% or 20' increase, whichever is greater), the architectural survey will consist of all resources that are adjacent to the existing ROW.

3. For all portions of the proposed line to be constructed within existing ROW and where new areas of vegetation will be cleared outside the existing maintained ROW, the architectural survey will consist of all resources that are within 0.5 miles on either side of the existing ROW.

4. For all portions of the proposed line to be constructed within new ROW, the architectural survey will consist of all resources that are within 0.5 miles on either side of the existing ROW.

B. Evaluating resources. Following the survey, certain resources may be found to be potentially eligible for listing in the National Register. These resources should be evaluated through Phase II archaeological investigations or intensive level architectural inventory. These evaluations should conform to DHR's *Survey Guidelines* (rev. 2003) and result in a recommendation on eligibility of the resources.

C. Assessing impacts to eligible resources. For those resources identified in the survey that are found to be eligible for listing in the National Register, the impact of the proposed project should be assessed using the procedure presented in Section I.C of this document.

D. Minimizing and mitigating negative impacts. If is it determined by the project proponent in consultation with DHR that the proposed project will significantly and negatively impact a historic resource listed in or eligible for listing in the National Register, the project proponent should propose a means for avoiding or minimizing the effect. If the impact can not be reduced to such a degree as to not cause a significant impact to historic resources, a means to otherwise mitigate the effect must be developed. Minimization and mitigation plans should be developed in consultation with DHR, the affected property owner, and any other interested party. If the project is subject to Section 106 of the NHPA, a Memorandum of Agreement must be executed between the Federal agency, DHR, the project proponent, and any consulting parties to address the adverse effects of the project.

E. Survey personnel and reporting. All survey, evaluation, and assessment must be conducted by or under the direct supervision of a qualified professional in the appropriate field meeting the Secretary of the Interiors *Professional Qualification Standards* (36 CFR 61) in accordance with the Secretary of the Interior's *Archeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines* (48 FR 44716-42) and DHR's *Survey Guidelines* (rev. 2003). Two copies any report should be submitted to DHR for review and approval prior to any ground disturbance.

DRAFT PROPOSAL FOR
VISUAL AND RECREATIONAL IMPACT ASSESSMENT FOR WIND TURBINES.
September 15, 2009

OUTLINE

I. Introduction
- A. Importance of Visual Resources in Virginia
- B. Define Visual Impact Potential for Wind Turbine

II. Define Virginia's Scenic and Recreational Resources
- A. Background
- B. State Programs for Scenic Resources
  1. Scenic Highways and Virginia Byways
  2. Scenic Rivers
- C. Other Scenic Resources
  1. Promontories
  2. Linear sites.
  3. Recreation areas
  4. Federally and state designated areas
  5. Regional resources recognized in the *Virginia Outdoor Plan [VOP]*
  6. Outdoor tourist destination

III. Impact Analysis
- A. Potential Impacts
  1. Visual contrast
  2. Consistent with local comprehensive plan
  3. Historic properties and vistas
- B. Assessment of Impacts
  1. Three dimensional modeling for visual assessment
     a. Turbines
     b. Transmission lines and substations
     c. Access roads
     d. Lighting
- C. Defining Visual Impact
  1. Scenic quality
     a. Visual characteristics
     b. Landscape features
     c. Man-made features
  2. Visual Sensitivity
     a. Frequency
     b. Viewing distance
     c. Length of time seen

d. Viewer volume
e. Viewer activity

D. Scoring
1. Scenic quality classification
2. Visual quality classification
3. Scoring process

IV. Mitigation
A. Mitigations and Remediation Options
1. Numbers of Turbines
2. Siting
3. Aesthetic offsets
4. Lighting
5. Alternative Construction Processes

B. Siting and Design Guidelines for Minimizing Visual Impact

References

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Virginia Department of Conservation and Recreation, 2007. 2007 *Virginia Outdoors Plan*. (http://www.dcr.virginia.gov/recreational_planning/vop.shtml)

Virginia Polytechnic Institute and State University, Community Design Assistance Center, May 2009. *Scenery Management Study for Claytor Lake, Prepared for Appalachian Power Company.*

DRAFT PROPOSAL FOR VISUAL AND RECREATIONAL IMPACT ASSESSMENT FOR WIND TURBINES.

September 15, 2009

I. Introduction

A. Importance of Visual Resources in Virginia

Landscapes of scenic importance are those that are recognized for their visual importance as seen from areas of scenic or recreational value. This would include both the near and far views as seen from recognized resources such as Virginia's scenic byways, scenic rivers, the Appalachian Trail, regional trunkline trails, national and state parks, designated historic sites, cultural areas, gardens and scenic attractions.

A number of programs exist for recognizing important landscapes at the local, regional, state or federal level. It is important that visually significant landscapes and the resources associated with them be identified as a part of the permitting process. A viewshed analysis prior to wind turbine project implementation will determine the impact on critical areas of the landscape and ways to eliminate or reduce these impacts.

B. Define Visual Impact Potential for Wind Turbine

Wind turbines become the focal point of visual and aesthetic concerns based on size and the visual patterns created by spacing, appearance, physical markings and lighting. The size of the wind turbines is the predominant source of visual contrast created by a wind energy facility. Often the maximum turbine and propeller height is over 300 feet. At this scale, and in settings that are typically free of other structures, trees and intervening terrain, wind turbines will be visible and a predominant feature in the landscape (AWEA, February 2008, pp 5-28 & p 3-3).

Visually sensitive areas and locations with scenically designated resources should be identified during the early stages of planning. A visual analysis of impacts to these areas should be conducted and assessments evaluated for mitigation. The siting and development of wind farms in Virginia should involve a formal visual assessment and analysis to determine compatibility with the surrounding landscape.

The visual analysis should include:

1. Extent to which the proposed wind farm will introduce visual contrast in the landscape,
2. Resulting adverse visual impacts.
3. Consistency with applicable laws, regulations plans and policies related to Virginia's scenic resources.

II. Define Virginia's Scenic and Recreational Resources

A. Background

The Commonwealth of Virginia has abundant and diverse visual and scenic resources that entice visitors and have a lasting appeal for residents. It has been established through Virginia's court system that states and localities can protect scenic resources

by upholding local landmark protection laws. Scenic resources are recognized by the mention of the word 'scenic' in over 160 sections of the Code of Virginia. The Code of Virginia §10.1-108 defines environment as "the natural, scenic, scientific and historic attributes of the Commonwealth." The effect of planning, transportation, mining, signage, advertising and management of the environment, including its scenic values are also referenced in the Code of Virginia. Mapping these resources within the area of the project site is critical to the assessment process (2007 *Virginia Outdoors Plan).*
http://www.dcr.virginia.gov/recreational_planning/documents/vopchapt07d.pdf

B. State Programs for Scenic Resources

1. Scenic Highways and Virginia Byways
Driving for pleasure has been ranked as one of the top five outdoor recreation activities for the past 40 years. The appeal of scenic roads is the intrinsic quality of Virginia's diverse landscapes and the ease of connecting with nature from the automobile. There are both national and state sponsored scenic roads programs. The Virginia Byways program in Virginia recognizes natural, cultural, historical, recreational and archeological amenities of the Commonwealth's scenic roads. In addition, the unique and varied culture and character of the geographic regions of the Commonwealth are represented by designated Virginia Byways throughout the state (2007 *Virginia Outdoors Plan*).
htttp://www.dcr.virginia.gov/recreational_planning/documents/vopchapt07e.pdf .

2. Scenic Rivers
The Virginia Scenic Rivers Act of 1970 created a statewide program to protect and preserve rivers or sections of rivers having natural or scenic beauty and cultural and historic interest. Since the first scenic river designation in 1975, 22 rivers totaling more than 505 river miles have been recognized, including one state historic river. Thirteen additional rivers have been evaluated and found to qualify for scenic river designation (2007 *Virginia Outdoors Plan).*
http://www.dcr.virginia.gov/recreational_planning/documents/vopchapt07d.pdf .

C. Other Scenic Resources
1. Promontories – overlooks – are established high points of land that extend into a body of water or are a headland or cliff. Promontories provide excellent viewing positions of the surrounding scenic landscape making the preservation of these sites and their viewsheds critical. Overlooks provide reflective places and contribute to the well-being of those who spend time there.
2. Linear sites – trails and byways/scenic pull-offs – including pull-off areas that highlight the natural landscapes of Virginia sought by tourists and citizens are often found along roadways and trails. All federal, state and regional trails recognized in the 2007 *Virginia Outdoors Plan* (VOP) should be included in the assessment. These resources provide access to some of the most scenic areas in Virginia.
3. Recreation areas – both private and public. These areas are dedicated to outdoor recreation opportunities for the public. Among them are areas for picnicking, hiking, camping, golfing, outdoor interpretation, boating, and other similar areas.

4. Federally and state designated or owned areas. For example, these types of areas may include state and federal parks, US Forest Service lands, state and federal wildlife management areas, Journey Through Hallowed Ground and Northern Neck Heritage Areas.
5. Regional resources recognized in the VOP – Regional and local planning agencies identify areas of regional outdoor and conservation significance. These recommendations are presented in the VOP and periodically updated to reflect changes in priorities throughout the Commonwealth.
6. Outdoor tourist destination – these include public and private destination points like gardens, interpretive sites, and other outdoor venues.

III. Impact Analysis

E. Potential Impacts

When state or federally designated scenic resources or parks are in proximity to the proposed wind turbine project, a formal assessment of visual compatibility for the proposed wind farm is required. The following topics may be addressed in the visual analysis overview.

1. Visual contrast – An assessment of the extent to which the proposed wind farm will introduce visual contrast in the landscape.
2. Consistent with local comprehensive plan – An assessment of the extent to which the wind farm will be consistent with the local comprehensive master plan and comply with any visual guidelines established for any federally and state recognized scenic resources.
3. Historic properties and vistas – An assessment of the affect of the wind farm on designated historic properties, districts and landscapes.

F. Assessment of Impacts

1. Three dimensional modeling for visual assessment

Visual assessment determines the visibility of project facility through three dimensional analysis. This analysis should employ computer modeling of the study area by imposing the physical dimensions of the project facilities, particularly the height of the turbines. This type of modeling will identify the areas from which the turbines can be seen and the areas in which terrain and vegetation would block or screen views of the project facilities. Using pre-and post-project conditions for key viewpoint, the visual analysis defines the degree of visual contrast and where the proposed project facilities will be visible. The types of visual intrusions which should be analyzed for wind turbine projects include turbines, project transmission lines and substations, roads and lighting impacts.

Once these items of impact are identified and mapped relative to Virginia's scenic and recreation resources and the potential impacts noted, it is necessary to conduct a complete visual analysis. The combination of scenic quality and visual sensitivity scores create an understanding of viewshed impacts.

a. Turbines - Assess where views of the wind turbines would be prominent and the distance from which the turbines would be viewed. The more frequent and closer the view of the turbines will translate to a greater impact for the viewer.

b. Transmission lines and substations - The electrical facilitates needed to transfer power from the wind farm to a local or regional electrical system should be considered in the visual impact analysis. The substation that connects it to the grid should be considered in the impact analysis.

c. Access roads - Extensive road systems are required for large-scale wind energy facilities. These roads provide construction and operation access to the turbines and support facilities. These access roads should be part of the visual impact analysis. The topography surrounding the access roads should be considered in this analysis.

d. Lighting - The requirement to install safety lights on the turbines and towers increases the visibility of the wind turbines during all times of the day. Federal Aviation Association (FAA) guidelines require flashing red lights at night for aviation safety. While it is difficult to simulate the appearance of synchronized, flashing red lights, the visual impact analysis should acknowledge and characterize this aspect of the project's visibility.
(American Wind Energy Association, February 2008)

G. Defining Visual Impact

The components needed to determine and evaluate the potential for visual impacts are taken from the May 2009 *Scenic Management Study for Claytor Lake* and include:
a. Characterization of the baseline or existing conditions using photography at near range, moderate range and far range of the project site.
b. Photographic simulations with superimposed before an after views.
c. An assessment of changes based on the baseline conditions.

Application of state-of-the-art digital terrain modeling and visual simulations as well as an integrated environmental design approach to project planning will help successfully integrate wind energy projects into the visual landscape. Conducting such analyses will provide objective criteria and defensible analysis upon which to base decisions.

1. Scenic quality

Scenic quality is measures of how visually pleasing people are likely to find a landscape. Scenic quality may be assessed based on three features: visual characteristics, landscape features and man-made features.

a. Visual characteristics – Visual characteristics are defined by the visual complexity and variety of the visual elements that comprise the landscape. Great visual complexity has been found to be correlated with higher visual quality. For example, a high degree of topographic relief and diverse vegetation patterns contribute to increased complexity and a variety in line, form, color and texture. These attributes create higher visual quality. The composition of each visual unit is examined in terms of the line, form,

color and texture that are characteristic of that unit. The great the variety or complexity of line, form, color and texture the high the scenic quality.

b. Landscape features – A landscape feature is an object or thing in the landscape that will influence a person's reaction to the scenic quality of the landscape. Physical features, such as topographic relief, vegetation patterns, and land use are important to visual quality. Landscape features may include natural objects such as rock formations, cliffs and pastures. If a natural landscape feature is relatively unique within the landscape of the area, such as a man-made historic structure or natural rock formation, it enhances the perceived scenic quality of the landscape.

c. Man-made features – Man-made features include any part of the landscape that is not natural. If a man-made feature or features is considered discordant with the natural landscape then the feature or features may detract from the scenic quality.

2. Visual sensitivity

Visual sensitivity includes the factors which influence concern for the landscape and those factors that influence the ability of alterations to blend into the existing landscape. The ability for landscape alterations to blend into the landscape is referred to as visual absorption capacity. It is a measure of the ability of a landscape to absorb alteration and changes from its natural state.

a. Frequency – Frequency is the number of times a turbine or other structure is seen during the course of travel. If a significant view is interrupted multiple times by a visual intrusion along a road or other linear path, the impact will be greater. For example, the greater number of times the viewer has an opportunity to see the turbines the greater the impact.

b. Viewing distance – Viewing distance considers how far the viewer is from the landscape. A landscape is considered to be more sensitive when viewed from a closer distance. Concern for the landscape is influenced by the distance from which it is being viewed and is typically divided into three distance zones and for the purpose of this study are defined as: foreground (0 to 1/4 mile), middle ground (1/4 to 1 mile), and background (beyond 1 mile). In the foreground the viewer is most influenced by landscape detail (i.e. individual structures, individual trees and plantings). Contrasts in the color and texture of building materials with the color and texture of the natural landscape are most evident in the foreground. In the middle ground, the details are less important and the overall patterns are apparent. Colors and textures of building materials are somewhat muted by the graying affect of atmosphere. Patterns created by topography and vegetation are apparent in the middle ground. The level of concern for visual quality in the middle ground relates to the extent to which development blends with the natural patterns in the landscape. The background distance and the graying affect of the atmosphere soften the

contrast between built and natural forms and there will be less concern for visual quality.

c. Length of time seen - When traveling a road or trail, the view is impacted to a greater extent if the natural view is interrupted for a longer period of time during travel. For example if the view of a turbine is completely unobstructed for ¼ mile the impact is greater than glimpses of the turbine between ridges or trees for ¼ mile.

d. Viewer volume - Landscapes that are viewed by many people will be a greater public concern than landscape viewed by fewer people. Thereby a landscape is considered to be more sensitive if a larger number of people are likely to see it.

e. Viewer activity - This criterion takes into consideration "what viewers are likely to be doing" when they view the landscape being evaluated. People's concern for the environment around them is influenced by the activity in which they are participating, while experiencing that environment. People who are recreating or living in a landscape are more likely to be concerned about its quality than people who are simply commuting through a landscape. Landscapes are more visually sensitive if they are seen by people participating in activities which would cause them to be more concerned about the appearance of the environment. (Virginia Polytechnic Institute and State University May 2009)

H. Scoring

The assessment of the impacts of proposed wind turbines on the visual quality of the area is required to determine if mitigation is required. The first aspect of the scoring assesses the scenic quality which is a measure of how visually pleasing people find a landscape. The second part of the scoring assesses the visual characteristics to determine the visual complexity and variety of visual elements that comprise the landscape.

1. Scenic Quality Classification

a. Low Scenic Quality. Units ranked as having low visual quality have no prominent physical landscape feature. Their visual attributes are not remarkable and lack viewing opportunity due to vegetation or topography. Man-made intrusions are dominant and are not consistent with the natural environment. (Score 1)

b. Moderately Low Scenic Quality. Units rated moderately low have little prominent physical landscape features. Viewing opportunities are limited by vegetation or topography so that visual attributes are not remarkable. Man-made intrusion is dominant in units ranked moderately low. (Score 2)

c. Moderate Scenic Quality. Units given high visual quality have physical landscape features of interest. Viewing opportunities have little limitation and

there are certain positive visual attributes. Man-made intrusion may exist in a unit rated as moderate. (Score 3)

d. Moderately High Scenic Quality. Units given high visual quality have prominent physical features. There are good viewing opportunities in these units and visual attributes are not notable. There may be man-made intrusion in the unit rated moderately high but these intrusions do not demolish the landscape integrity. (Score 4)

e. High Scenic Quality. Units rated as having high visual quality have prominent physical landscape features. These visual attributes are distinct and allow great viewing opportunities. These are few to no man-made intrusion in these units. If man-made intrusions are present, they can barely be seen directly. (Score 5)

2. Visual Sensitivity Classification

a. Low Visual Sensitivity. Units with low visual sensitivity are areas of minimal concern by only a small number of people. The viewing activity is rare and simple. The visual absorption capacity in the unit is comparatively high. (Score 1)

b. Moderately Low Visual Sensitivity. Units with moderately low visual sensitivity are areas where viewing activity by people is limited. The visual absorption capacity in such units is comparatively high. (Score 2)

c. Moderate Visual Sensitivity. Units with moderate visual sensitivity concern a certain number of people, who participate in activities while experiencing the environment. Visibility is restricted and visual absorption capacity is either comparatively low or comparatively high. (Score 3)

d. Moderately High Visual Sensitivity. Units with high visual quality concern a number of people who frequently experience the environment. The visual absorption capacity in these units is comparatively low. (Score 4)

e. High Visual Sensitivity. Units with high visual quality are of interest to a large number of people who frequently participate in activities while experiencing the environment. Recreation, tourism and residential uses may be present in or near the viewing area. The visual absorption capacity of these areas is comparatively low. (Score 5)

(Virginia Polytechnic Institute and State University, May 2009)

3. Scoring Process

1. Rate the visual impact of each site from a scenic quality classification and visual sensitivity classification.
2. Weight combined scores based on area of impact.
3. Determine action from established weighted combined scores.

a. A <u>low</u> score (0-2) allows the project to go forward without any mitigation.

b. A moderate score (3-5) requires mitigation a plan &/or reduction in number of turbines.

c. A moderate-high score (6-8) requires siting changes, mitigation, reducing the number of towers &/or remediation

d. A high score (9-10) prevents the project from being built

Scenic Quality Classification	Visual Sensitivity Classification	Impact Rating	Combined Score	Action
1	1	Low	0-2	No Mitigation Required
2	2	Moderately-Low	3-5	Mitigation Required
3	3	Moderate		
4	4	Moderately-High	6-8	Move, Remove, Mitigate &/or Remediate
5	5	High	9-10	Project Cannot Move Forward

V. Mitigation

A. Mitigations and Remediation Options

1. Numbers of turbines

The visual impact may relate to the numbers of wind turbines planned in the landscape. Reducing the numbers of wind turbines in area with high visual sensitivity may be appropriate mitigation.

2. Siting

Visual contrast with the existing landscape is often unavoidable because of the size and typical location of wind farms. The incorporation of design alterations into project facilities to limit the degree of visual contrast and reduce the prospect of that contrast may be considered a part of project mitigation. Micro-siting to minimize visual impacts may be possible.

3. Aesthetic offsets

An aesthetic offset is a correction or remediation of an existing condition located in the same viewshed of the proposed development that has been determined to have a negative visual or aesthetic impact. Aesthetic offsets should be considered as a mitigation option in situations where visual impacts are unavoidable or where alternative mitigation options are only partially effective or uneconomical. Aesthetic offsets could include reclamation of unnecessary roads in the area, removal of abandoned buildings, cleanup of illegal dumps or trash, or the rehabilitation of existing erosion or disturbed areas (BLM 2005a).

4. Lighting

The need for red flashing safety lights on some portion of the turbines and met towers can be avoided only by using structures less than 200 feet in height. The visibility and potential visual impact of safety lighting can be reduced only through siting actions that would reduce the overall visibility of the wind turbines, such as locating turbines in areas where there are few or no viewers, and/or in

areas where natural features (terrain and vegetation) would block or limit views of turbines from sensitive locations.

5. Alternative Construction Processes
To avoid the construction of large maintenance roads and clearing areas for access of equipment, aerial construction techniques could be considered. In cases of high visibility and long term concern of the visual impact from the access roads, this construction alternative could eliminate or minimize impacts.
(American Wind Energy Association, February 2008)

B. Siting and Design Guidelines for Minimizing Visual Impact
1. Wind Turbines shall be a non-obtrusive color which blends with the surrounding environment.
2. Wind energy facilities shall not be artificially lighted, except to the extent required by the Federal Aviation Administration or other applicable authority that regulates air safety.
3. Wind turbines shall not display advertising, except for reasonable identification of the turbine manufacturer, facility owner and operator.
4. On-site transmission and power lines between wind turbines shall, to the maximum extent practicable, be placed underground.
5. Identify and locate all significant scenic resources within the viewshed from the top of the tallest turbine rotor at its highest point
6. A decommissioning plan shall include the removal of all turbines and ancillary structures and restoration/reclamation of the site.
(Pennsylvania Model Ordinance for Wind Energy Facilities, March 21, 2006)

References:

American Wind Energy Association (AWEA), February 2008. *American Wind Energy Association Siting Handbook.* (http://www.awea.org/sitinghandbook/)

Bureau of Land Management, December 2008. *Wind Energy Development Policy.* (http://www.blm.gov/wo/st/en/prog/energy/wind_energy.html)

Pennsylvania Wind Energy Working Group, March 21, 2006. *Pennsylvania Model Ordinance for Wind Energy Facilities.* (http://www.pawindenergynow.org/)

US Forest Service (USFS), 1996. *Aesthetics: A Handbook for Scenery Management.*

Virginia Department of Conservation and Recreation, 2007. 2007 *Virginia Outdoors Plan*. (http://www.dcr.virginia.gov/recreational_planning/vop.shtml)

Virginia Polytechnic Institute and State University, Community Design Assistance Center, May 2009. *Scenery Management Study for Claytor Lake, Prepared for Appalachian Power Company.*

Potential Adverse Impacts:
Landscapes of Ecological Importance—Erosion and Sedimentation

Background

Site disturbance for the construction of wind turbines and wind farms has the potential to create significant erosion and surface water sedimentation through the displacement of soil, rock and rubble. In addition to potentially degrading soil and surface water resources, sedimentation of cold water streams is of concern. A large number of Virginia's threatened and endangered species are residents of cold water ecosystems [get exact percentage here]; erosion and sedimentation (E&S) therefore also represents a generalized threat to the habitat of a large number of sensitive species. Because Virginia's land-based wind resources are greatest along mountain ridgelines and upland slopes, E&S constitutes a major potential adverse impact.

Current Regulatory and Administrative Authority

Three different agencies directly or indirectly affect E&S. These are:

1. **Department of Conservation and Recreation, Division of Soil and Water Conservation (DCR-DSWC).** The construction phase of wind projects fall under the regulatory requirements of two programs administered by DCR-DSWC: 1) The Virginia Erosion and Sediment Control Program, and 2) The Virginia Stormwater Management Program. These programs apply to development projects during the construction phase of the project only. Regulatory authority for both programs end when the construction activity is complete, all infrastructure has been installed (including permanent Stormwater BMPs) and all disturbed areas are completely stabilized. DSWC does not have any programs or permits that apply to development activities after construction is complete. Construction projects must comply with Virginia's Erosion and Sediment Control Law (Virginia Code 10.1-563) and regulations (4 VAC 50-30-30 and 4 VAC 50-30-40). An ***E&S Plan*** is required The Virginia Erosion and Sediment Control (E&S) Program Regulations apply to non exempt land disturbing activity in excess of 10,000 square feet, which includes land disturbing activity related to wind projects (including on shore infrastructure related to off shore projects) . However, because wind projects are private development the E&S program requirements are not administered directly by DSWC. The E&S regulations for private development activities are administered primarily by local governments (Counties, Cities and Towns) with a few exceptions. The exceptions are when localities opt to allow their local soil and water conservation district to administer the E&S program. In the case of private development projects and local E&S programs, DSWC's role is one of oversight and Technical Assistance: Each local E&S program must be approved by the Soil and Water Conservation Board and is reviewed for consistency with the E&S law every 5-years; and, the DSWC provides technical assistance with any portion of program administration (administration, plan review, inspection, enforcement) at the request of the local program. ***E & S Annual Specifications*** for *Power line* construction must comply with the company's annual specifications for erosion and sediment control in accordance with Section 10.1-563D of the Virginia Erosion and Sediment Control Law (VESCL) for land-disturbing activities greater than 10,000 square feet (2,500 square feet in Chesapeake Bay Preservation Areas). Construction of company buildings, facilities, and other structures are not

regulated at Section 10.1-563D, and therefore, must comply with the requirements of the appropriate local ESC Program.

2. **Department of Game and Inland Fisheries, Environmental Services Section (DGIF)**. DGIF administers the Virginia Fish and Wildlife Information Service (VWIS) and has regulatory authority for Virginia's Threatened and Endangered fish and wildlife. In addition, DGIF is vested with the authority to conserve and manage all fish and wildlife in the Commonwealth. Upon request, DGIF will provide location-specific analysis of a wind installation on fish and wildlife and their habitats, including cold water streams. Using the resources of VWIS, the Environmental Services Section will provide summary reports of the potential wildlife and coldwater stream impacts, and recommend mitigatory measures if necessary. These mitigatory measures are not mandatory, however, and DGIF has no enforcement authority. [Confirm. Not sure if this is exactly correct.]

3. VDOT. Road construction. [Elaborate]

Gaps and Problems with Current Regulatory Frameworks

There are two (three?) key issues associated with current regulatory frameworks. These are:

1. Local E&S officials in rural areas, where Virginia's wind resources are greatest, often do not have the expertise to effectively review E&S plans for steeply sloped or sensitive environments. In addition, they may lack the requisite manpower for rigorous site inspections and enforcement. Local E&S capacity represents a notably weak link in the regulatory system with respect to E&S control for the construction of wind farms.

2. Site developers are not obligated to seek DGIF reports on the proximity of cold water streams to their construction sites [check], and DGIF mitigatory measures for cold water streams are recommended but not mandatory. In addition, DCR's evaluation of E&S plans focuses specifically on the risk of migration of soil/rubble offsite, and not on the presence or needs of cold water streams per se.

3. Anything on VDOT/roads?

Options for the Permit by Rule

3. Do nothing other than acknowledge the existing DCR permitting process for E&S and role of DGIF.
4. Attempt to strengthen the DCR local E&S system with respect to wind installations.
5. Attempt to hold applicants accountable for obtaining DGIF cold water stream analysis reports and any recommended mitigatory measures.
6. Anything for VDOT, roads?

Recommendation #1: Strength E&S Programs (Y/N?)

The permit-by-rule should strengthen the DCR local E&S system with respect to wind installations by (a) requiring early notification of DCR of a pending wind project, (b) require a performance bond (this is currently optional for local programs), and (c) requiring third party inspectors, which significantly increases the quality of onsite inspection and maintains a constant channel of communication between DCR, local E&S programs, and site developers.

Specifically, we suggest that:

1. The PBR require that the Department of Conservation and Recreation be informed of the pending project in the early stages of planning. The responsible party/applicant should have a pre-construction conference on-site with the Erosion & Sediment Control Program local program authority and representatives of DCR's Stormwater Program prior to development of the erosion & sediment control plan and the stormwater management plan. This will help ensure that any obvious site considerations are addressed in the initial plans.

2. The PRB implement DCR's recommendation that Wind Energy Projects be required to secure a performance bond that is of an amount adequate to construct the entire suite of practices necessary to fully implement the final approved erosion & sediment control plan. (The local program authority currently has the option to require a performance bond for land disturbing activities to ensure that adequate funding exists if the local program authority finds it necessary to step in and have appropriate erosion & sediment controls put in place.)

3. The PRB implement DCR's recommendation that third party inspectors be used for Wind Energy Projects. DCR has experience with requiring large, linear utility projects (gas pipelines, etc.) to hire a 3rd party project inspector to carry out a higher frequency inspection rate and monitor corrective actions to ensure required erosion & sediment controls in installed properly in a timely manner and maintained until final stabilization is completed.

Suggested Language:

> {Company Name/ "The Applicant"} will provide at least one full-time, DCR approved inspector for the project prior to the initiation of any land disturbing activity. The inspector will provide inspection oversight of the project for compliance with the Virginia Erosion and Sediment Control Law and Regulations. The inspector must hold a current certificate of competence from the Virginia Soil and Water Conservation Board in the area of project inspection or combined administrator. The DCR approved inspector will conduct erosion and sediment control inspection following the initial installation of erosion and sediment control measures, at least once every 7-day period, within 24 hours following a rainfall event and at the completion of the project to insure proper final stabilization of the site. Inspection reports will be provided, within 24 hours following an inspection, to the local Erosion and Sediment Control Program Authority and the DCR Regional Office serving that area.

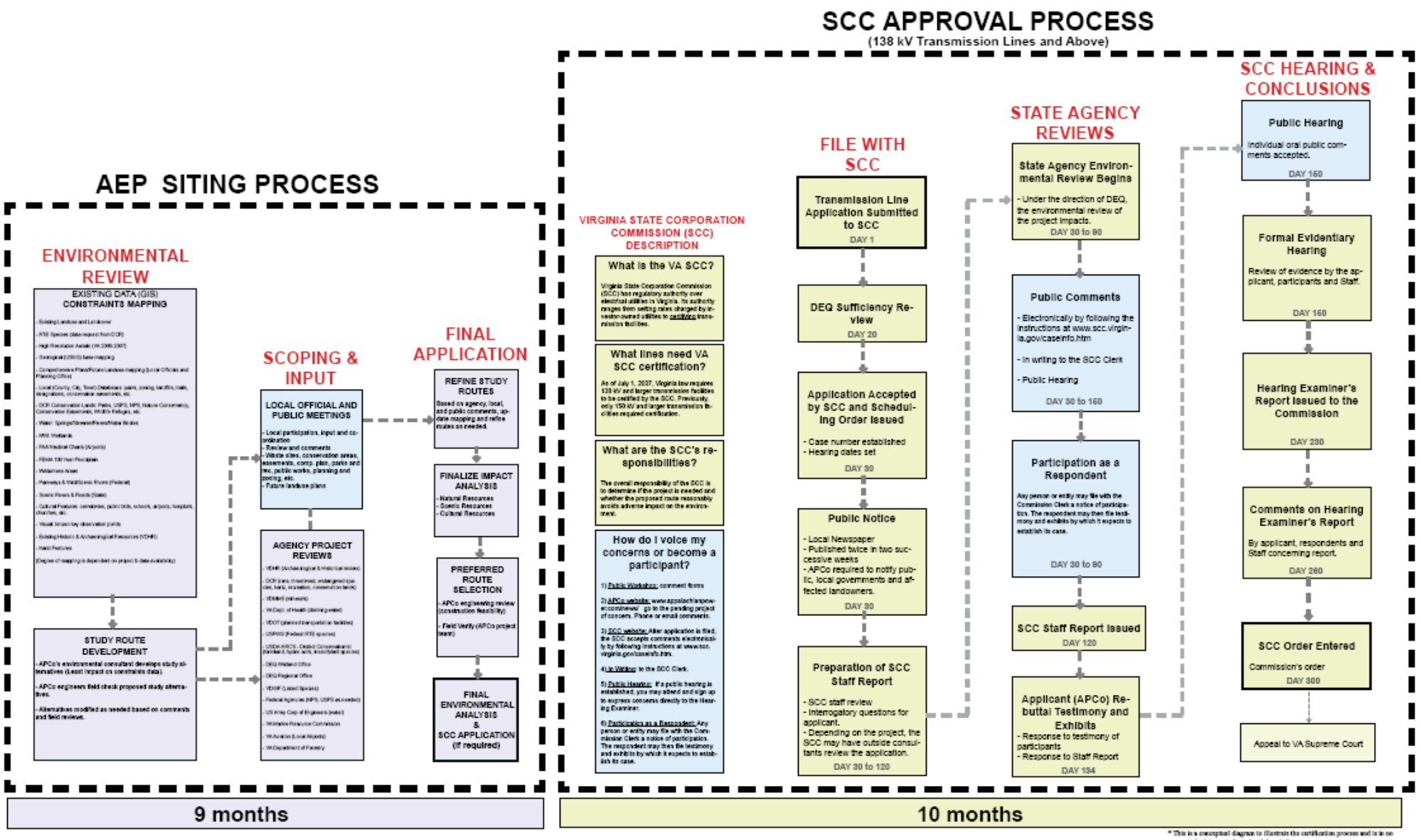
Recommendation #2: Hold Applicants Responsible for Cold Water Stream Impacts **(Y/N?)**

We suggest that the PBR hold applicants accountable for obtaining DGIF cold water stream analysis reports by requiring that developers request such reports and explicitly address how they will address any mitigatory measures recommended by DGIF.

Suggested Language:

> The applicant shall obtain a report from the Department of Game and Inland Fisheries on the presence or proximity of cold water streams to the proposed project. A copy of this report shall be included in the applicant's analysis of the beneficial and adverse impacts of the proposed project on natural resources. If the Department of Game and Inland Fisheries recommends mitigatory measures for the proposed project, the applicant shall submit a mitigation plan detailing the reasonable actions to be taken by the owner or operator to avoid, minimize, or otherwise mitigate cold water stream impacts and to measure the efficacy of those actions.

ATTACHMENT 7



* This is a conceptual diagram to illustrate the certification process and is in no manner to be interpreted as a legal description.
* Hypothetical timeline shown. Timeline is affected by many variables, which are impossible to foresee.

DEQ Wind Energy Regulatory Advisory Panel (Wind RAP)
Attachment C - General Subcommittee Draft Meeting Notes
September 17, 2009

Location: **DEQ Piedmont Regional Office**
Glen Allen, VA 23060

Start: 09:42 A.M.
End: 3:00 P.M.

Subcommittee Chair: Nikki Rovner, Deputy Secretary of Natural Resources
Recorder: Debra Miller, DEQ

Subcommittee Members Present:
Debi Osborne, Audubon (Alternate for Mary Elfner)
James Golden, DEQ
Ken Jurman, DMME
Don Giecek, Invenergy (Alternate for John Daniel)

Subcommittee Members Absent:
Theo de Wolff, Independent Developer
Jayme Hill, Sierra Club
Mary Elfner, Audubon (Alternate Present)
John Daniel, Independent Developer Rep (Alternate Present)

Guests/Speakers:
Melanie Davenport, Director of Enforcement, DEQ

Public Attendees:
David Phemister, TNC (Alternate)

Agenda Item: Welcome and Introductions

Discussion Leader: Nikki Rovner
Discussion: Subcommittee Chair, Nikki Rovner, welcomed members of the subcommittee to the meeting and introductions were made.
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Agenda Item: Enforcement Information

Discussion Leader: Melanie Davenport
Discussion: Nikki introduced Melanie Davenport, DEQ's Enforcement Director. Melanie provided the subcommittee information on DEQ's authority from this statute, enforcement regarding this Act, and subsequent regulation/PBR enforceability. There will need to be clear language that allows for DEQ to enforce the provisions of the PBR/regulation. This is necessary so that DEQ has the authority to ensure Wind Energy Facilities meet the criteria of their PBRs. Melanie and James provided issues and examples of how DEQ enforces conditions of plans approved by other agencies in general permits for other DEQ programs (AFO/Biosolids – Nutrient Management Plans). For this regulatory action, there will need to be language that DEQ has ability to enforce the requirements of the PBR (i.e., the plans) and the regulation needs to provide the enforceability of the PBR. If this is too nebulous, it makes enforcement difficult. It was noted that much of the criteria/standards that will be used will need to be provided by the other subcommittees. How DEQ assures compliance was also discussed. Compliance can be accomplished through the submittal of reports (required by permit/regulation) and also through DEQ inspections. The group finished the conversation by discussing which of the submitted documents will need to be enforceable by DEQ. Some of the submitted documents may not need DEQ to have enforcement authority regarding the requirements of the document, such as the interconnection agreement. The only requirement is that it be submitted, and others will ensure the criteria of that agreement are followed.

Agenda Item: Update on Tier Concept

Discussion Leader: Nikki Rovner
Discussion: Nikki provided an update on the "tier" concept that was discussed with the other chairs. The reason for tiers, and why it may need to be discussed in the plenary group, is that much will depend on what the other groups recommend and the slim cost benefit to the lower wattage projects. At the previous meeting, the general subcommittee recommended 500kW as the de minimis exemption (note, 500 kW is the commercial net-metering threshold).

Agenda Item: Review of Discussion Document

Discussion Leader: Nikki Rovner
Discussion: Nikki had sent regulatory/ordinance language examples from multiple states to the subcommittee for review and consider for draft regulatory language. The discussion draft, which contained the various examples, was reviewed and the group considered which examples looked workable as good starting points. This document provided example language on general application requirements, site plans, design plans, operations/operational plan, decommissioning and financial assurance.

General Application Requirements
This example language was taken from the solid waste regulations regarding PBR submittals. The subcommittee agreed that the general application language looked good and once criteria from the other subcommittees and "enforceability language" examples are provided, this section will then be further clarified and refined based on that information.

Site Plan Requirements
The five options provided were discussed as there was a lot of good information. Many of these are ordinance model language for local governments, but it provides good information for consideration. The subcommittee then reviewed the options and discussed what looked like good language. Issues regarding project boundaries and the radius outside this boundary and what information should be included were considered as was what will need to be defined. The site plan options had typical engineering site plan criteria (site layout) and ones that included environmental details (location of T&E species, wetlands, etc.). The project boundaries and what it is defined as was discussed in further detail. The definition of wind energy facility will need to consider project boundary. After discussing the various options, the language from various options will be used to provide another draft to the subcommittee.

Operating Plan and Design Plan Requirements
It was noted that very little information was found on operating plans and much of the design information involved requirements for color, advertising, etc. Those examples may not provide what is needed for this regulation, so further discussion on what an operations plan and design plan will look like is necessary. Language is necessary because the statute requires it. The industry reps were asked to provide what is included in their operations and design plans and list of those elements that could be placed in this regulation. For design, much of it will be certification that the facility has been properly designed in accordance with appropriate criteria. This is something that is nominally required for PBRs as they do rely on professional certifications to ensure facilities are properly designed. For operations, an issue that was noted is that there may be a need to include language so that mitigation criteria of the mitigation plan will be considered (e.g., if mitigation requires cut-in speeds).

Decommissioning and Financial Assurance
Several options for decommissioning were provided and reviewed. A main issue is what level of site restoration is necessary. Returning to pre-construction native habitat was discussed but not all property may be in "native" state, so there should be allowance for other restoration include landowner prerogative on what to do with his land. However, landowner prerogative should be part of the owner's agreement with the facility. For the purpose of financial assurance, what is required for decommissioning will drive what amount of financial assurance is necessary. The main point of decommissioning is to leave the site so that it will not have a deleterious effect on human health or the environment for either on-site or off-site or both. The financial assurance will provide funding for DEQ to restore the site in an appropriate environmentally protective manner if the owner is unable to do so.

After further discussion, the subcommittee decided to start with the language provided in option two and revise it as needed. Issues regarding localities that have standards and those that do not were discussed. The regulation will provide minimum decommissioning standards and localities can provide additional standards as they see fit. Financial assurance is necessary so that the state can properly decommission a site when necessary. The question of inclusion of salvage value of the equipment was also discussed as it relates to the amount necessary to post for financial assurance. The regulatory language for financial assurance under the solid waste regulations will be reviewed in regard to process and mechanisms used.

Terms and Definitions
A reminder to the subcommittee regarding terms and definitions was made. As part of the regulation, there will need to be a section on definitions. A listing of terms to be defined will need to be started. A strawman of terms/definitions may be helpful for the other subcommittees as well. This subcommittee will be discussing terms and definitions later in the day.

At 12:15pm, the subcommittee adjourned for lunch. The subcommittee reconvened the meeting at 1:02pm.

Agenda Item: Public Participation

Discussion Leader: Nikki Rovner
Discussion: There were discussions on what party will be responsible for the 30-day comment period, either DEQ or the applicant. Two examples of draft language were reviewed. The subcommittee discussed the pros and cons of both approaches and the statutory language requirements including other agency coordination. Based on these discussions, the subcommittee recommended developing the language based on the current language of the VSWMR and will bring that to the plenary session. The issue of the 30-day review time for DEQ was discussed further and it was decided that the actual review time may need to be adjusted depending on the criteria created by the other subcommittees and what DEQ would need to check.

The language for permit modification was also discussed. Things that may require modification of a PBR were discussed and may include some repowering (if turbine type not modified) and mitigation modifications. However, if a new issue arises regarding T&E, then this PBR would not provide coverage; however, if it was a declining of a bat species and the PBR "limit" would not change. It was noted that for operational non-compliance issues, these are normally resolved through compliance by the compliance and enforcement process. Based on the example language, the group recommended removing the key personnel language from the permit modification language.

Agenda Item: Applicability and Definitions

Discussion Leader: Nikki Rovner
Discussion: This section will include the de minimis threshold for these projects. Examples of definitions were reviewed (many had come from the VSWMR). The discussion document included example definitions for "wind energy facility" and some concern over the inclusion of transmission lines and substations as it

impacts the project boundary. The 2nd definition (Model Ordinance for Wind Energy Facilities in PA) will be used with some revision including removal of the last sentence.

Agenda Item: Other Issues

Discussion Leader: Nikki Rovner
Discussion: Other issues that will need to be clarified include enforcement issues raised from this morning's discussions. This will include which of the documents submitted will need to be enforceable and how to ensure the language provides that enforceability. The mitigation plan is a primary example of a document that will need to be enforceable by the PBR and regulation. The subcommittee discussed other plans that may need to be included under "enforceable."

Agenda Item: Fees

Discussion Leader: Nikki Rovner
Discussion: As part of the act, DEQ will charge permit fees and additional fees for inspections. Fees will need to be considered and will depend on DEQ estimations of the cost to run this program. It is likely that there will not be a high number of these facilities. Permit fees will be based on the FTE needs for the program. Also, based on inspection needs, additional fees will also need to be considered. The subcommittee discussed the statutory language regarding fees. Fees for PBR modifications will also be necessary as they are permit fees. This topic will require more review before estimation of the fee necessary can be provided. There will be an initial fee, a permit fee, and a modification fee, the subcommittee discussed annual fees and if they should be included in this regulation. The solid waste permit fee regulations will be reviewed and that language will be considered when developing this fee language.

Agenda Item: Questions for Other Subcommittees

Discussion Leader: Nikki Rovner
Discussion: Nikki relayed questions from the other subcommittees of pertinence to this group. These questions concerned:
Q: What constitutes a facility?
A: Still discussing that term.
Q: What about the impacts from transmission and substations?
A: Only transmission and substation impacts from those located on the property will be addressed by this regulation. Off-site lines and substations are outside the scope of the PBR.
Q: Do we have a list of state permits required?
A: Yes, a flowchart has been developed. The subcommittee reviewed this flowchart which includes permits most likely to be required. This flowchart will be updated to reflect the actual process, i.e., what the developers will need to do first, second, etc.
Q: What if the PBR is issued and the other permits have not been issued, will the developer be allowed to proceed without those permits?
A: This PBR does not exempt a developer from obtaining all other permits necessary. If the developer cannot proceed without a particular permit, then the PBR cannot be used as a means to authorize proceeding.
The next topic was in regards to cumulative impacts and how to or if that needs to be dealt with under this regulation. Additional research will be done and provided to this subcommittee.

The subcommittee meeting was adjourned at 2:55pm.
The next and final meeting of this subcommittee will be on October 13, 2009, at DEQ's Central Office.

Parking Lot:
- ✓ Defining facility and project area boundaries

Subcommittee Assignments:

- ✓ DEQ - Research "tier" model language of other states.
- ✓ Don – Provide the elements of an operations plan and ask John for information on what is needed in an design plan for a wind facility.
- ✓ Deb – Discuss with Leslie B. language for FA mechanisms and provide draft language to Nikki.
- ✓ David – Provide language for decommissioning restoration language and redraft Subsection C of the draft discussion document with a focus on disturbed earth.
- ✓ Nikki – Ask Melanie about the statutory authority comments regarding what provisions are necessary in the regulation.
- ✓ Deb – Send Fee Regulation, 9 VAC 20-90, to Nikki.
- ✓ James – Discuss with admin folks to determine basis for possible fees.
- ✓ James – Research the issue of cumulative impacts for wetlands/air/waste and send guidance to Nikki.